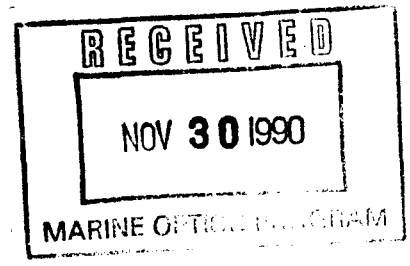
Hanauma Bay Ecological Survey: A Baseline Study

Honolulu, Hawaii

by
Mary E. Sano



with
Bob Dickerson
Betsy Reynolds
Cheryl Rosenfeld
Steve Russell
George Stender
Kyle Teshima-Miller

Prepared by the
Marine Option Program
University of Hawaii
October, 1990

Abstract

Hanauma Bay is a heavily used MLCD (Marine Life Conservation District) on the island of Oahu, Hawaii. This survey is a baseline study for a potential on-going assessment of Hanauma Bay's ecological environment by the UH Marine Option Program.

A team of students and staff from UH Manoa and Windward Community College conducted a series of five underwater transects from February through July of 1990. This report estimates percent coverage and number of invertebrates per meter square of the substrate. The biomass (pounds/acre), species diversity and total number of individuals of fishes is estimated in a corresponding report by George Stender of Windward Community College. The five transecting sites were chosen for their varying locations within the bay and were representative of different habitats.

The Department of Parks and Recreation, City and County of Honolulu requested the Marine Option Program to conduct this study to provide background information for their controversial new management plan which places heavy restrictions on commercial use of the bay.

Hanauma Bay supports a rich diversity of marine life. Due to its proximity to Honolulu proper, the bay must be carefully managed, so that its ecosystem is not abused.

Acknowledgements

This study was initially prompted by Robin Bond of the Department of Parks and Recreation, City and County of Honolulu. A special thanks goes out to him for providing assistance and support. Also thanks to Walter Ozawa, Director, Parks and Recreation, Alan Hong, Ocean Recreation Specialist for the City and County of Honolulu, who helped enormously in zodiac maneuvering, and the entire Parks and Recreation staff of Hanauma Bay.

Thanks to Steve Russell and Betsy Reynolds for encouragement, guidance and support during this study.

List of Participants

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Betsy Reynolds - MOP student, University of Hawaii at Manoa

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INTRODUCTION

During the summer of 1989, the Department of Parks and Recreation of Honolulu contacted the Marine Option Program at UHM to request that an ecological inventory of Hanauma Bay be conducted. This survey was meant to provide scientific baseline information which will be used by the city and county to assess a new, restrictive policy for the use of Hanauma Bay.

Although sometimes resulting in controversy, the importance of Hanauma Bay both as a recreational area and as a site to be preserved for its ecological value, make this a significant and worthwhile study.

The Marine Option Program agreed to the proposal, as the survey could also serve as a baseline study for future reference.

Conducting the study over a five month period, a team of students and staff from the Marine Option Program collected data to quantitatively estimate the diversity and abundance of fish, the diversity of attached macro-invertebrates and their percent coverage on the substrates. Limited limu (seaweed) data was also collected.

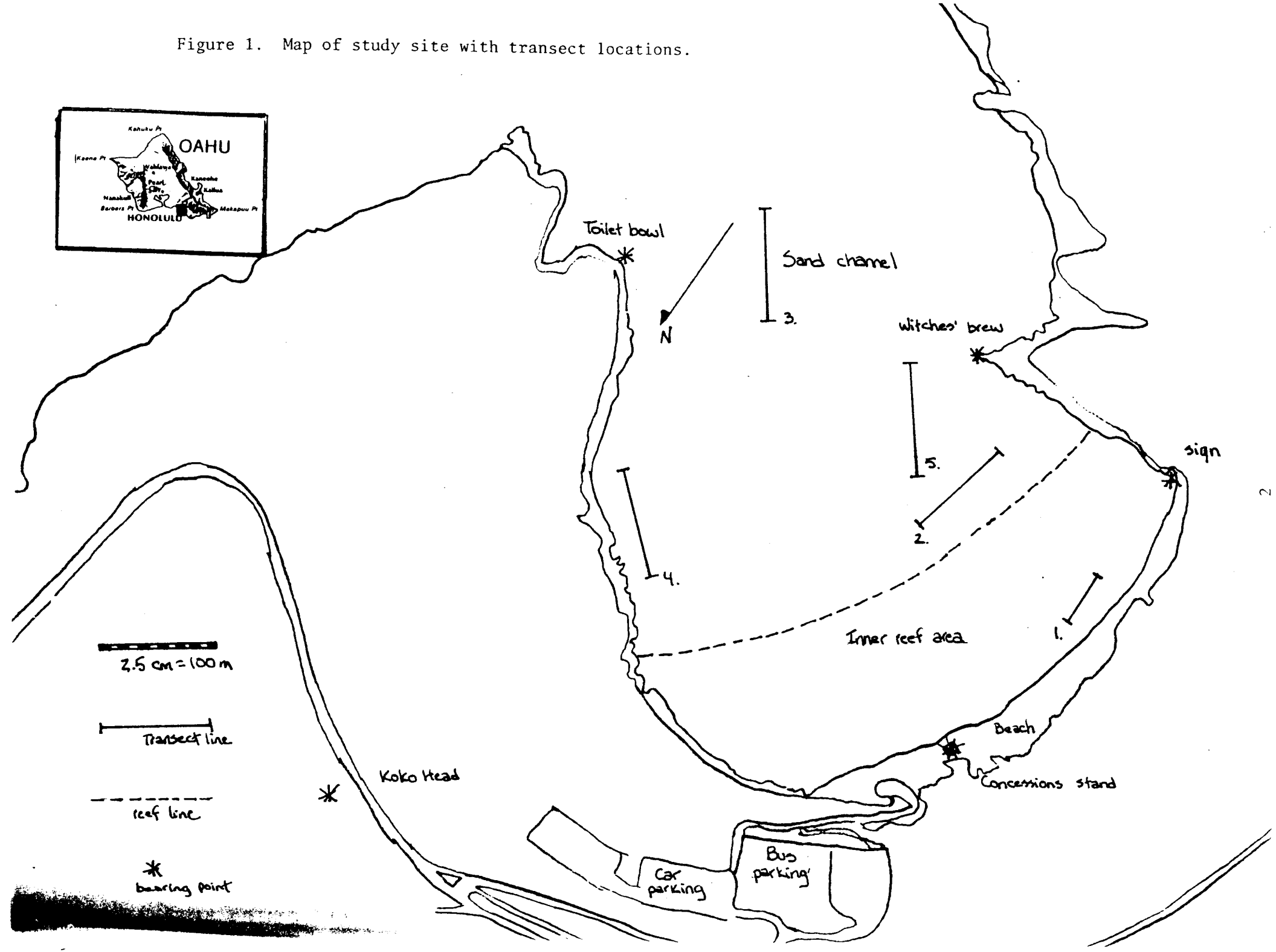
MATERIALS AND METHODS

Hanauma Bay is a semi-enclosed body of water approximately ten miles from Honolulu proper. A permit to launch and operate an inflatable boat within the bay was obtained from the Division of State Parks, DLNR. (see Appendix II) The Motomar allowed for efficiency and mobility in executing the dives. A collecting permit was obtained from the State Division of Aquatic Resources.

Five transects were selected to represent different habitats and different regions of the bay. Each transect was 100 meters long, except for transect #1, which was 50 meters.

Transect #1 was placed inside the inner reef area parallel to the south-facing shoreline at an average depth of 0-1 meter. Transect #2 was placed outside the reef line at depths ranging from 2-7 meters. This transect was also parallel to the same shoreline. At an average depth of 10-13 meters, transect #3 was placed in a sand channel just outside the deep water boundary, running perpendicular to the south-facing shoreline. Transect #4 ran perpendicular to the same shoreline, close to the west-facing wall of the bay. Transect #5 ranged from 5-8 meters and was placed near "Witches' Brew", a characteristically high surge area (Figure 1).

Figure 1. Map of study site with transect locations.



This ran in a perpendicular direction to the south-facing shore. Depths were determined using a Scubapro depth gauge.

Exact locations of the transects were determined by taking bearings using a compass at the surface directly over the ends of each transect. Fixed points were determined and exact bearings were recorded (Table 1). The line was then laid out according to a pre-determined direction following the bearings. (see map-Figure 1.) Each end of the transect line was tied off. Galvanized pipe could not be used to secure the transect lines because the substrate was too hard to drive a pipe through.

After deployment of the transect line, a team of two divers began the fish survey. Approximately ten minutes later, two more divers entered the water to begin the substrate survey. The grid-quadrat method was used (Reed, 1980) to determine percent coverage of attached macro-invertebrates, limu, and abiotic features of the substrate. The transect line was marked off at 10 meter intervals. At each interval, a 1 meter x 1 meter quadrat was placed. This quadrat was divided into 16 equal squares by 3 horizontal and 3 vertical lines running across it, creating 25 intersecting points.

Percent coverage of the substrate was determined by using a point - intersecting method. Every 10 meters, the species of coral, algae and other macro-invertebrates within the quadrat were identified. Four quadrats were recorded on each data sheet. The percent coverage (M) of each of the species was calculated by counting the number of intersecting points where each species occurs (T), and dividing by the total number of points in the quadrat (25), then multiplying by 100.

$$M = (T/25 \times 100)$$

Coral species were identified according to Edmondson (1977). Algal species were identified according to Magruder and Hunt (1979), and other invertebrates were identified according to Fielding (1985).

RESULTS

For percent coverage of all recorded substrate in all transects, see Table 2.

Transect #1 was inside the inner reef area and was very shallow, with depths ranging from 0-1 meter. Substrate was mostly reef rock, coral rubble, and a mixture of sand and coral rock. Very small patches of dead *Pocillopora sp.* (damicornis?) were recorded.

Table 1

Magnetic compass bearings of transect locations

Transect	Bearing	Koko Head	Concession Stand	Sign	Toilet Bowl	Witches' Brew
1	70	20	350	170	-	-
2	15	20	320	-	80	135
3	170	20	350	-	-	-
4	180	15	315	-	-	140
5	300	-	320	-	-	225

Each transect had two to four bearings taken at one end of the line (Koko Head, Concessions Stand, etc). As the divers set the transect line, they followed the bearing listed in the first column.

Three small patches (5-8 cm) of *Porites lobata* were also recorded, however, due to the nature of the point - intersecting method, they are not counted in the data assessment.

Some coral rubble was encrusted with a *Porolithon* species. *Leptastrea purpurea* and one *Echinometra mathaei* were the only other living substrate to be counted using this method.

Porites lobata was the dominant species of coral in transect #2 at 20.36% coverage. *Pocillopora meandrina* was often present, but dead and counted in the "other" category. Although it is the most common *Pocillopora* species in Hawaii, it is very sensitive to sediment pollution. (Maragos, 1972, (Edmondson)) *Pavona sp.* on quad #7 was unrecognizable.

Transect #3 was placed in a sand channel, and the substrate coverage was 100% sand.

Transect #4 had small patches of *Porites compressa* and *Pavona duerdeni* that do not show in the data because of the quantifying method used. At the beginning of the transect, *Pocillopora meandrina* was found dead in several places. Although *Montipora capitata* was the dominant species of coral recorded, there was evidence of bleaching around the edges of two of the colonies. This and transect #3 (sand channel) were the only transects when a diver was specifically taking data of algae. On this transect, *Grateloupia filicina* and *Boodlea composita* were the most common species of algae found. The 0.44% of *G. filicina* was the only limu counted however, when analyzing the data. Also present was *Caulerpa taxifolia, C. serrulata*, *Neomeris annulata*, *Lyngbya majuscula*, and a *Laurencia* species.

In transect #5, *Porites lobata* was the dominant species with small colonies of *Porites compressa*. In quadrats #6 and #7-reef rock covered with algal mat was comprised mainly of *S. furcigera*. *Echinometra mathaei* was recorded three times, but never fell within quantifying measures. Two dead colonies of *Pocillopora meandrina* were recorded and were counted in the "other" category.

Table 2

Average percent coverage of substrate

	Transect 1	2	3	4	5
Corals:					
Leptastrea purpurea	0.67	0.0	0.0	0.0	0.36
Montipora capitata	0.0	0.0	0.0	5.82	0.73
Montipora flabellata	0.0	0.0	0.0	0.0	0.36
Pavona duerdeni	0.0	0.36	0.0	0.0	0.0
Pavona varians	0.0	0.36	0.0	0.0	0.0
Pocillopora meandrina	0.0	0.73	0.0	0.37	0.73
Porites compressa	0.0	0.73	0.0	0.0	1.09
Porites lobata	0.0	20.36	0.0	0.73	6.18
Other invertebrates:					
Palythoa tuberculosa	0.0	1.45	0.0	0.0	0.36
Algae:					
Grateloupia filicina	0.0	0.0	0.0	0.44	0.0
Porolithon species	0.67	0.0	0.0	0.0	0.0
Sand	0.0	8.36	100.	41.45	20.73
Other *	98.67	67.64	0.0	50.90	68.36
Total average % of live coral	0.67	22.54	0.0	6.92	9.45

Total percent substrate cover

Transect #1	100.68
Transect #2	100.35
Transect #3	100.00
Transect #4	99.71
Transect #5	98.90

Note: Algae was only recorded on transect #4.

* "Other" category includes: reef rock, coral rubble, sand and rock mixture, dead coral.

Table 3

Number of Macro-invertebrates per square meter

	Transect 1	2	3	4	5
ECHINODERMATA					
Echinometra mathaei	0.67	0.36	0.0	0.0	0.0
CNIDARIA					
Palythoa tuberculosa	0.0	1.45	0.0	0.0	0.36
Total	0.67	1.81	0.0	0.0	0.36

Note: On transect #2 there were two *Heterocentrotus mammillatus* recorded, and one *Tripneustes gratilla* recorded. They did not fall within analyzing parameters. Transect #5 had three *Echinometra mathaei* that did not show in results.

DISCUSSION

This study provides baseline data for future studies to be conducted at the same site. Abundance of live substrate was contrasted from transect to transect. The sand channel and the inner reef area had little to no live substrate, while the others had a diversity of species of coral. The corals were generally healthy with the exception of two species. *Montipora capitata* showed signs of bleaching on one transect, and *Pocillopora meandrina* was found dead on several occasions.

This study shows that in some areas outside of the heavily used inner reef region, there is an abundance and diversity of corals and other invertebrates. There is good reason that Hanauma Bay is a popular marine recreational area. It is important that the management of the park is planned and executed so that the bay can continue to support both the needs of the people and the needs of its own ecological system.

REFERENCES

Edmondson, C.H. 1977. Reef and Shore Fauna of Hawaii. B.P. Bishop Museum Special Publication 64 (1st edition), Honolulu. 268 pp.

Fielding, A. 1985. Hawaiian Reefs and Tidepools. Oriental Publishing Company., Honolulu. 103 pp.

Magruder, W.H. and J.W. Hunt. 1979. Seaweeds of Hawaii. Oriental Publishing Company., Honolulu. 116 pp.

Reed, S.A. 1980. Sampling and Transecting Techniques on Tropical Reef Substrates. In, Environmental Survey Techniques for Coastal Water Assessment Conference Proceedings. Sea Grant Cooperative Report UHIHI-SEAGRANT-CR-80-01. pp71-90.

Mary Sano
17 Feb 1990 /

Appendix I

Key:
LP = Leptastrea purpurea
P = Porditthon sp.
PL = Porites lobata

Transect #1 Hanauma Bay

Conditions: calm, partly cloudy water temp - cold

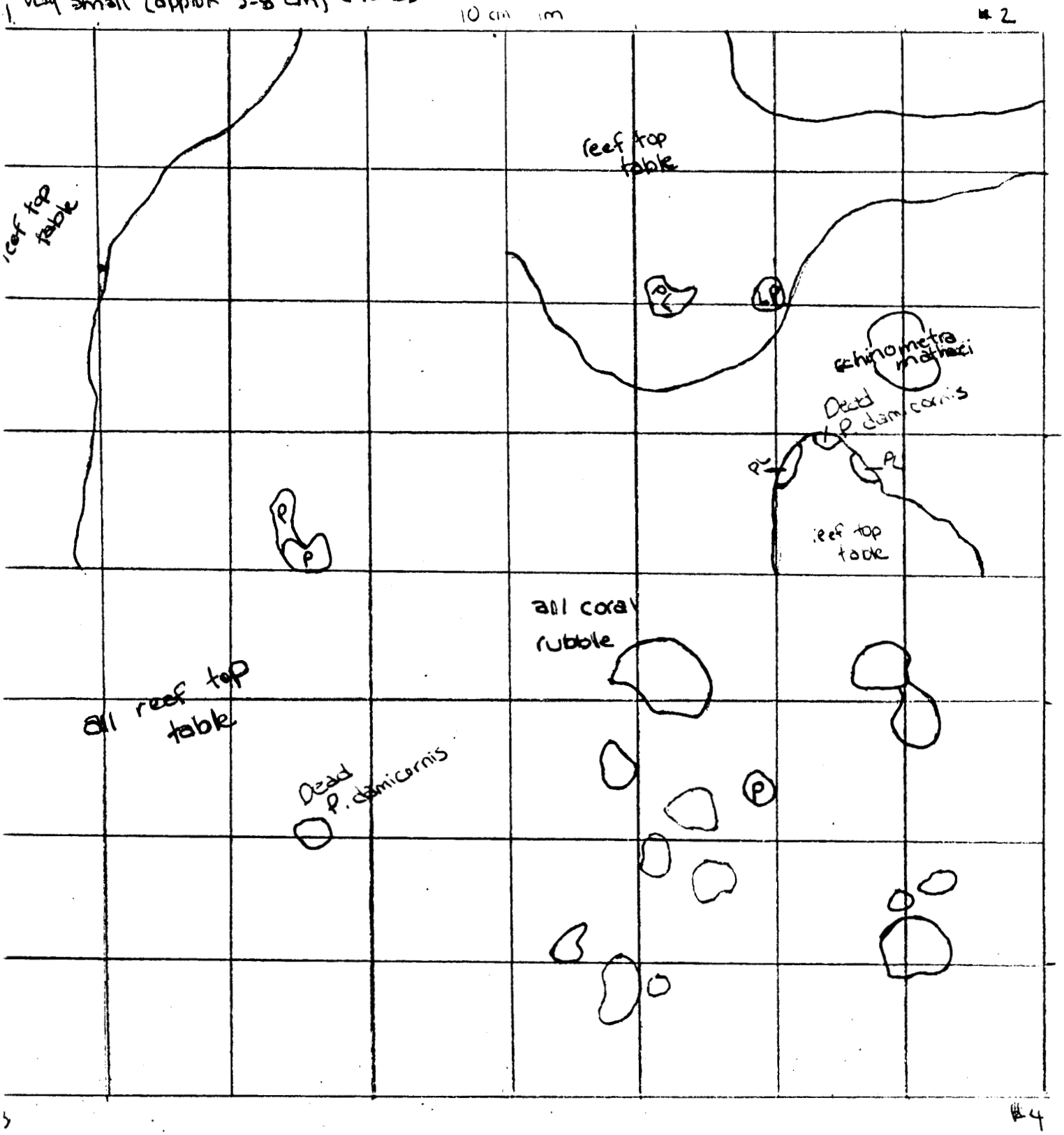
Observations:

Start - 9:30

Very shallow 0-1m (0-3ft) approx

Finish - 10:30

Not much live substrate. Mostly reef top table with some rubble
Very small (approx 5-8 cm) colonies of live P. lobata and L. purpurea on #2



Mary Sano
P Fed, A90
#1 Hanauma Bay

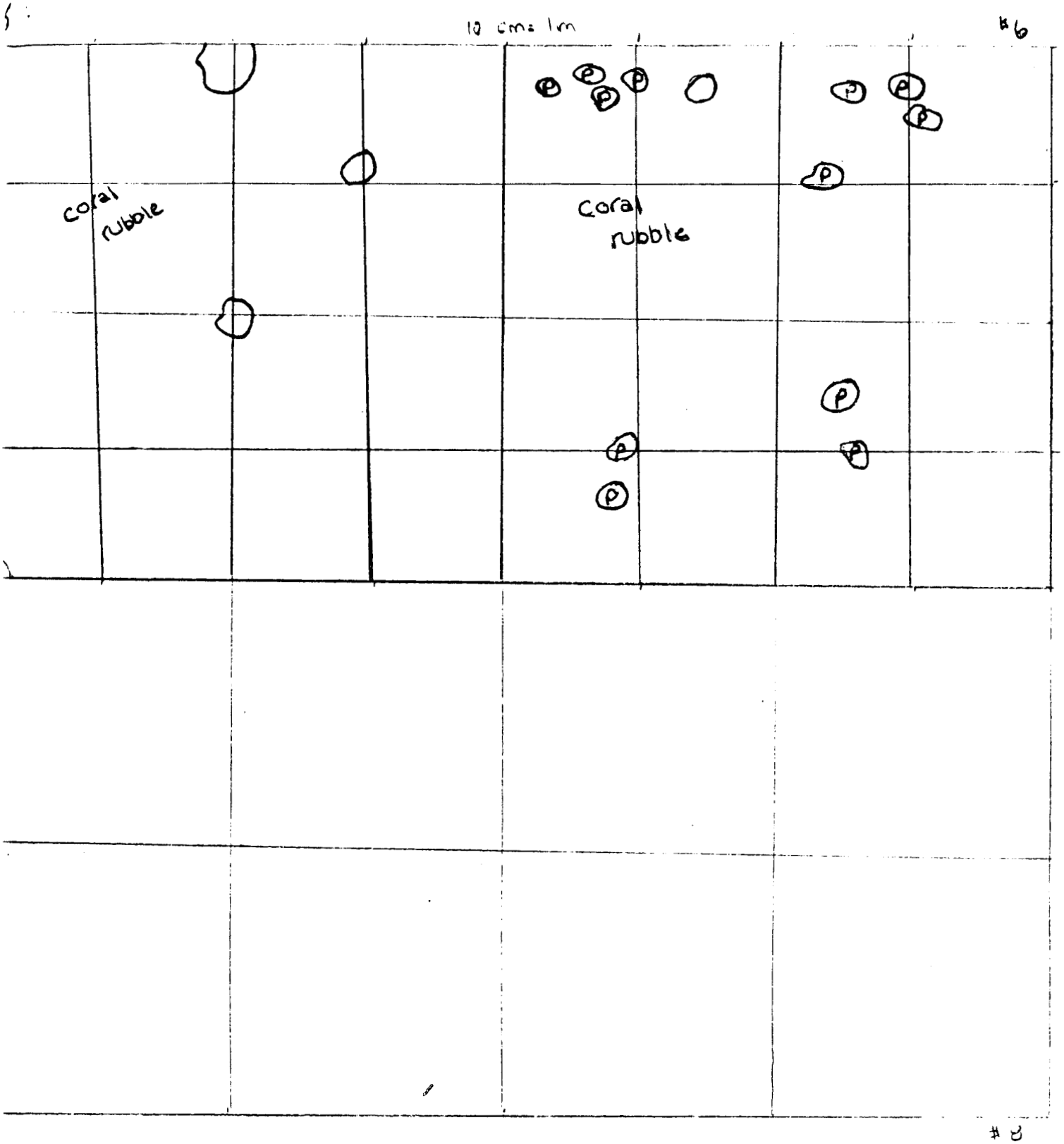
Appendix I, cont.

Key

P= Porolithon sp.

servations: No live coral.

#5- Floor covered with small pieces of coral rubble - only ones shown are larger pieces #6- small pieces of rubble w/ porolithon incrustations.



Mary Sano
17 Feb. 1990
reef #2
ations: calm, mostly sunny
start: 11:45 finish:
vations:

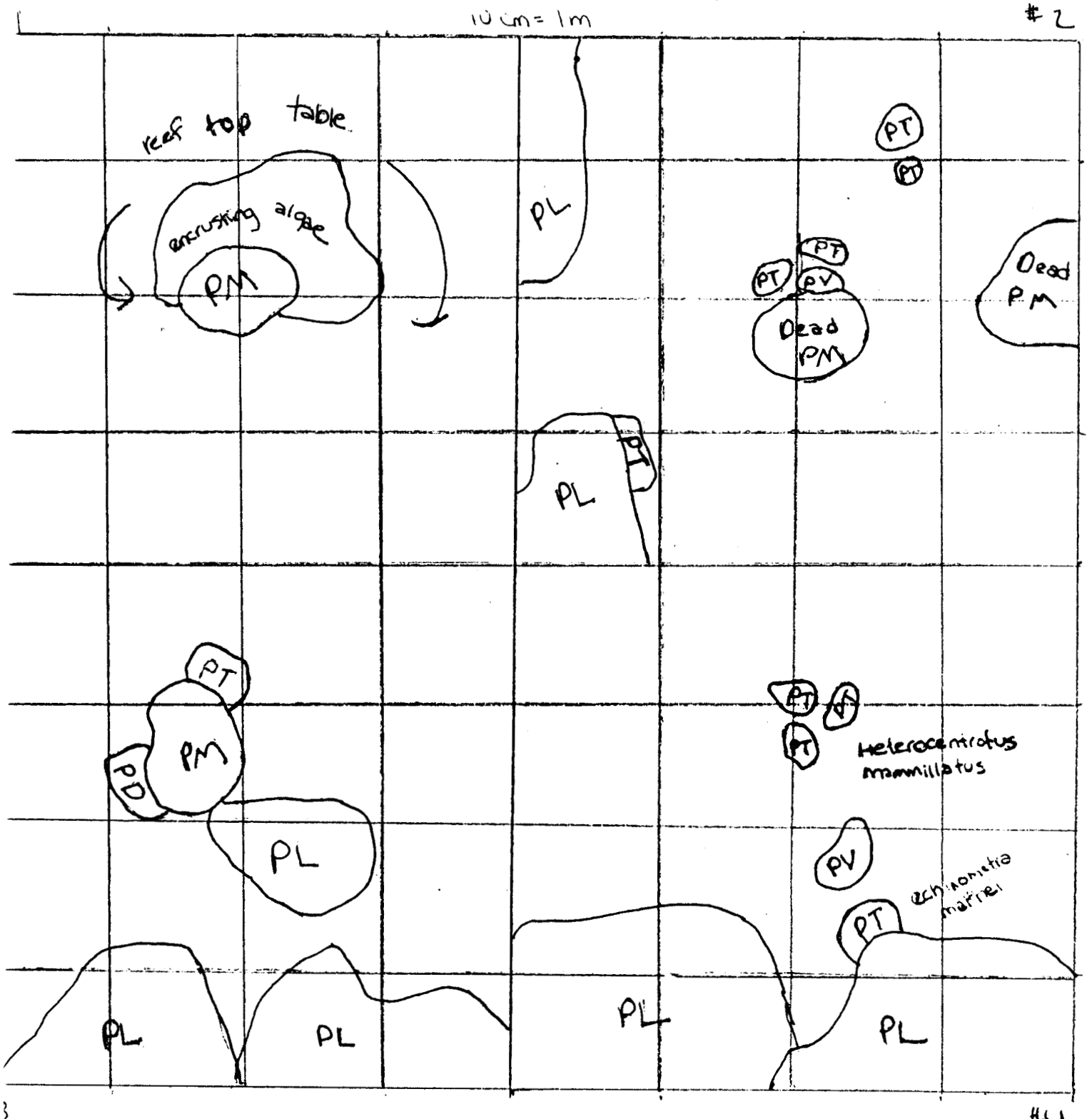
Appendix I, cont.

page 1 of 3
transect only

Key: PD = Pavona duerdeni
PL = Porites lobata
PM = Pocillopora meandrina
PT = Palythoa tuberculosa
PV = Pavona varians

Visibility: 30 ft (+) Most coral was Porites lobata. meandrina was also present but often dead.

average depth = 2-7 m (5-20 ft)



[redacted] Sano
17 Feb, 1990
[redacted] #2 Heiau Bay

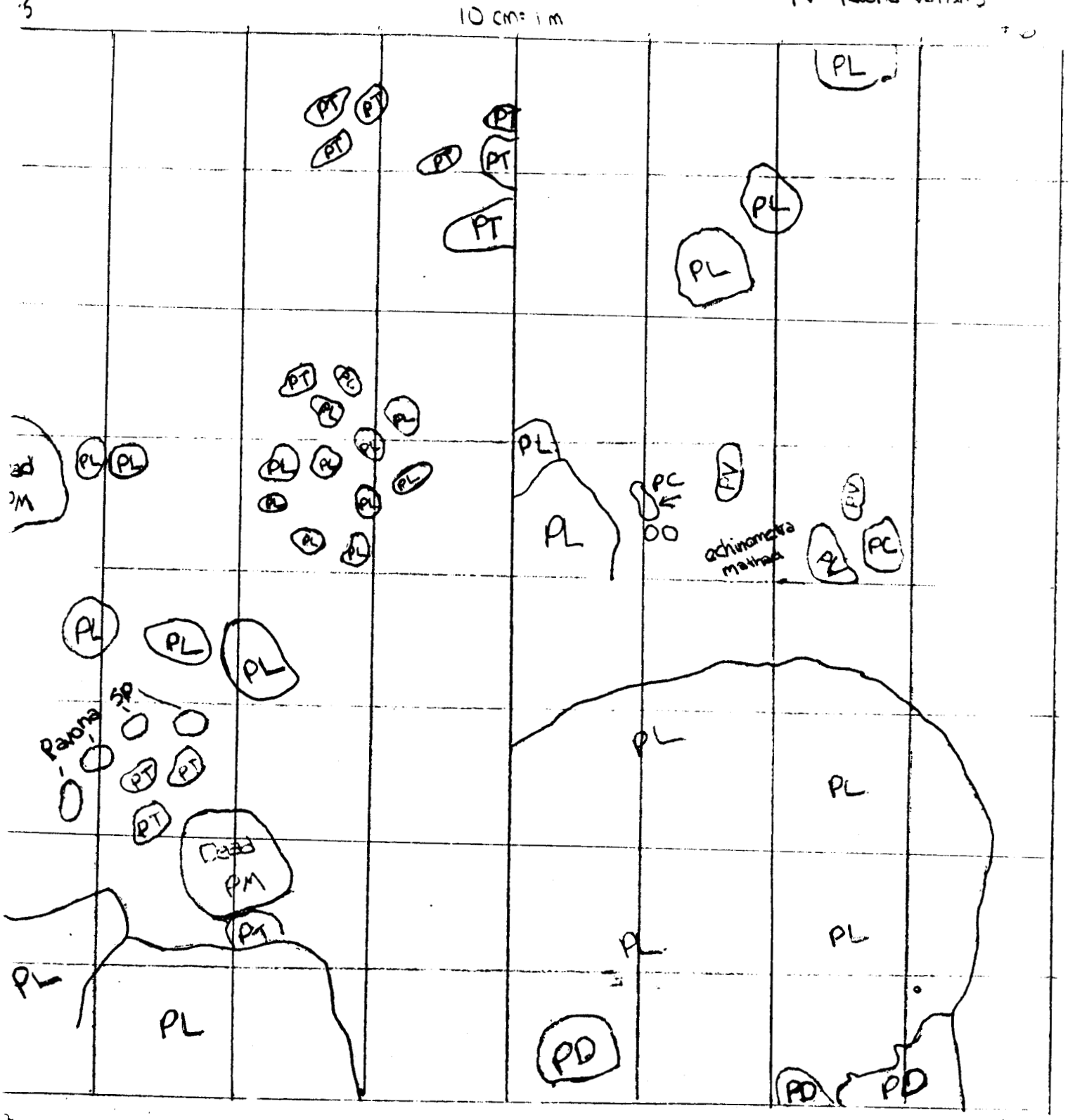
Appendix I, cont.

Page [illegible]

Key

PC = Porites compressa
PD = Pavona duerdeni
PL = Porites lobata
PM = Pocillopora meandrina
PT = Palythoa tuberculosa
PV = Pavona varians

Observations: Patchy P. lobata on #5. not sure of [illegible] sp on #7 P. meandrina present, but dead 10 was large colony of encrusting P. lobata



Mary Sand
17 Feb, 1993
Plot #2
Luna Bay

Appendix I, cont.

Key
PC = Porites compressa
PD = Pavona duerdeni
PL = Porites lobata
PM = Pocillopora meandrina
PT = Palythoa Tuberculosa
PV = Pavona varians

Synthesis: small colony of dead P. damicornis. P. lobata abundant on #10 & #9, mostly sand bottom w/ increasing P. lobata and larger colonies of P. compressa

#9

10 cm = 1m

#10

PL
PL
PL
Dead P. damicornis
PT
PC
PL
PL
PC
PL
heterocentrotus mammillatus
PD
PV
PL
PL
echinometra matthei
echinometra matthei
PL
PL
Tripneustus gratilla
PM
PL
PL
PL
coral rubble
PC
sand

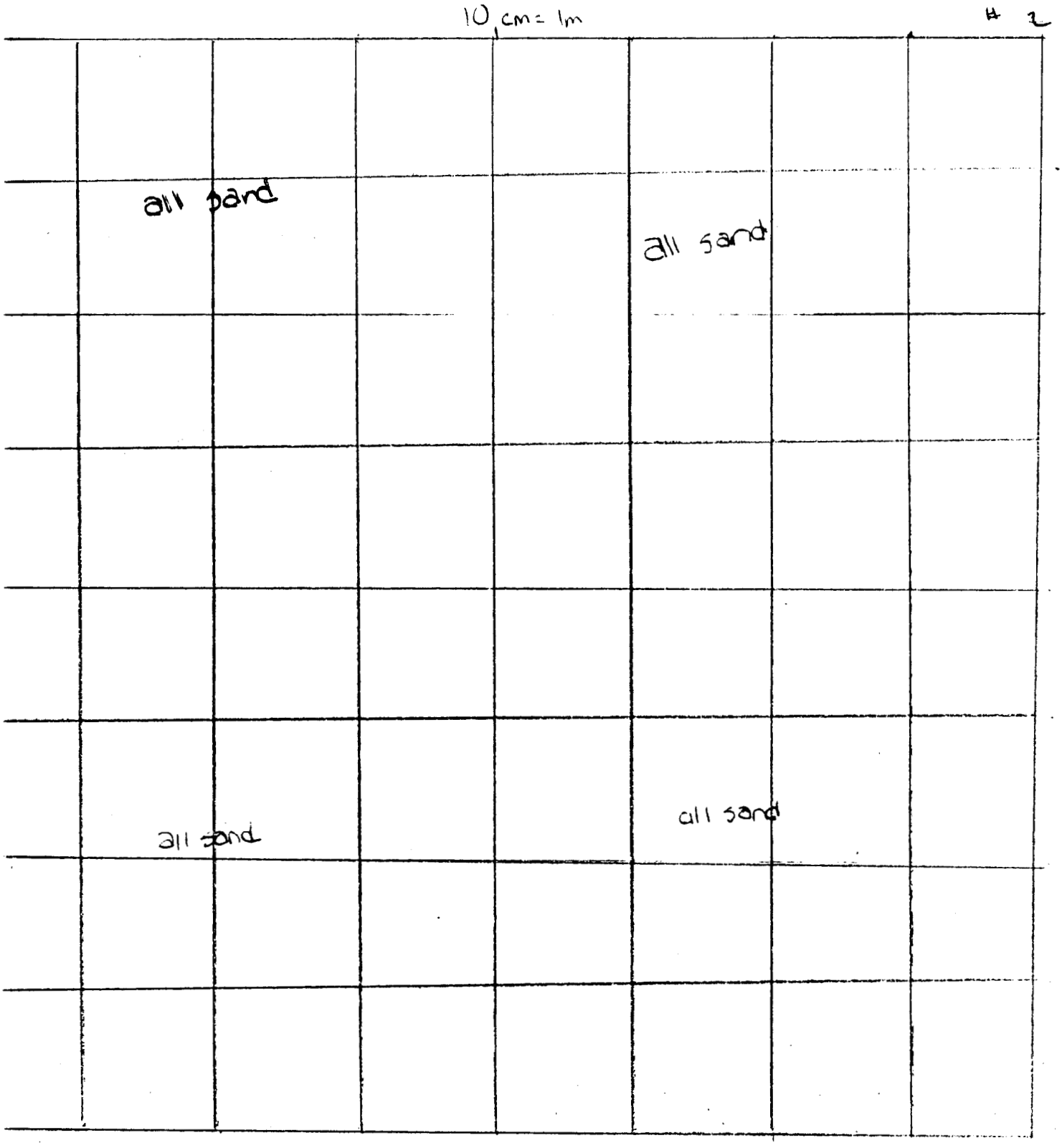
Mary Sard
7 Mar 1995
Dive # 3
Sumi Bay

Appendix I, cont.

Key

Conditions: sunny, warm water temp - cool. 9-13 m

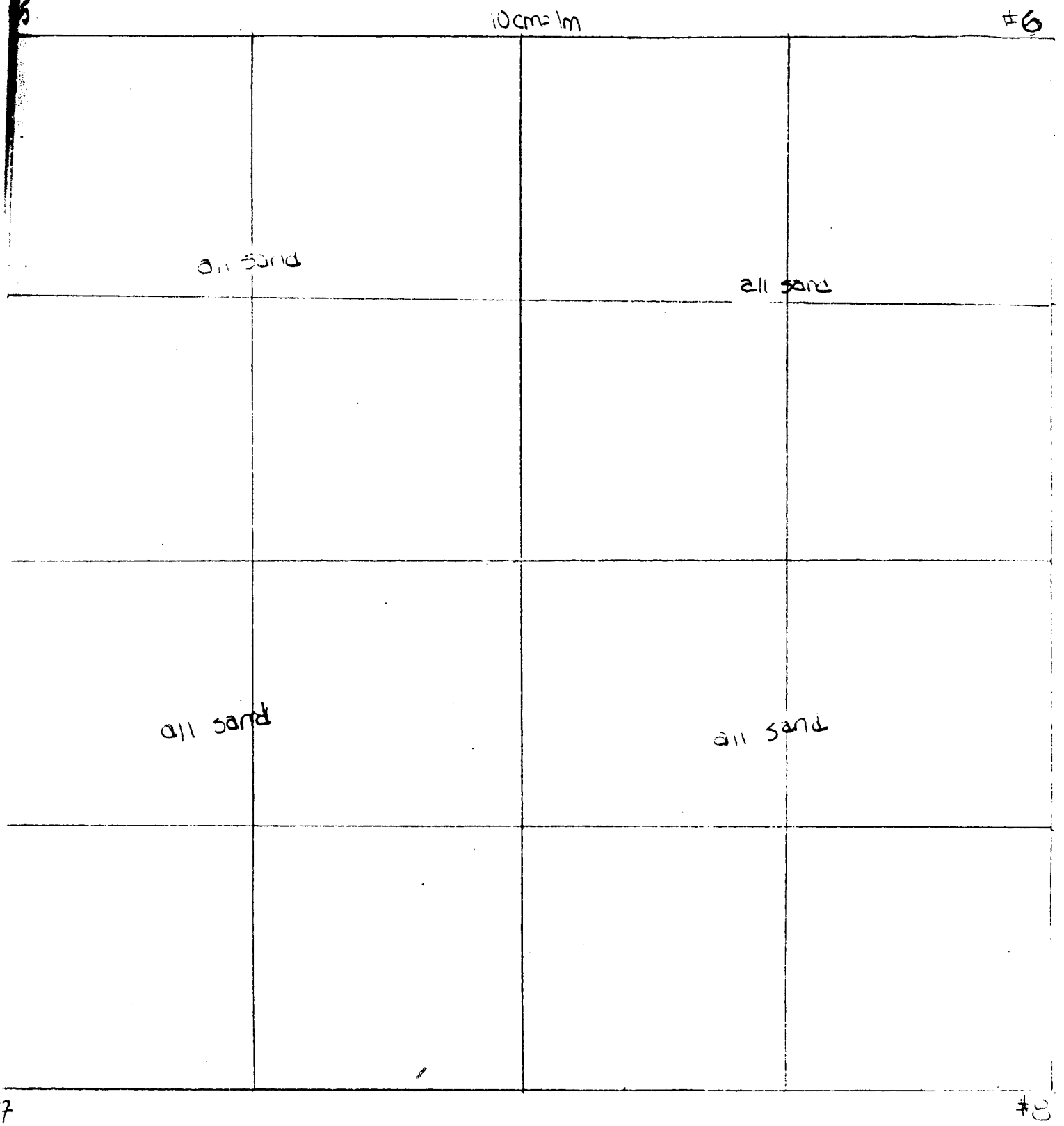
Notations: This line was set on a sand channel. No corals - dead or alive. Same for following 2 data sheets



Mary Jane
17 March 1990
t # 3
mo Bay
rations: See page 1 of 3

Appendix I, cont.

Key

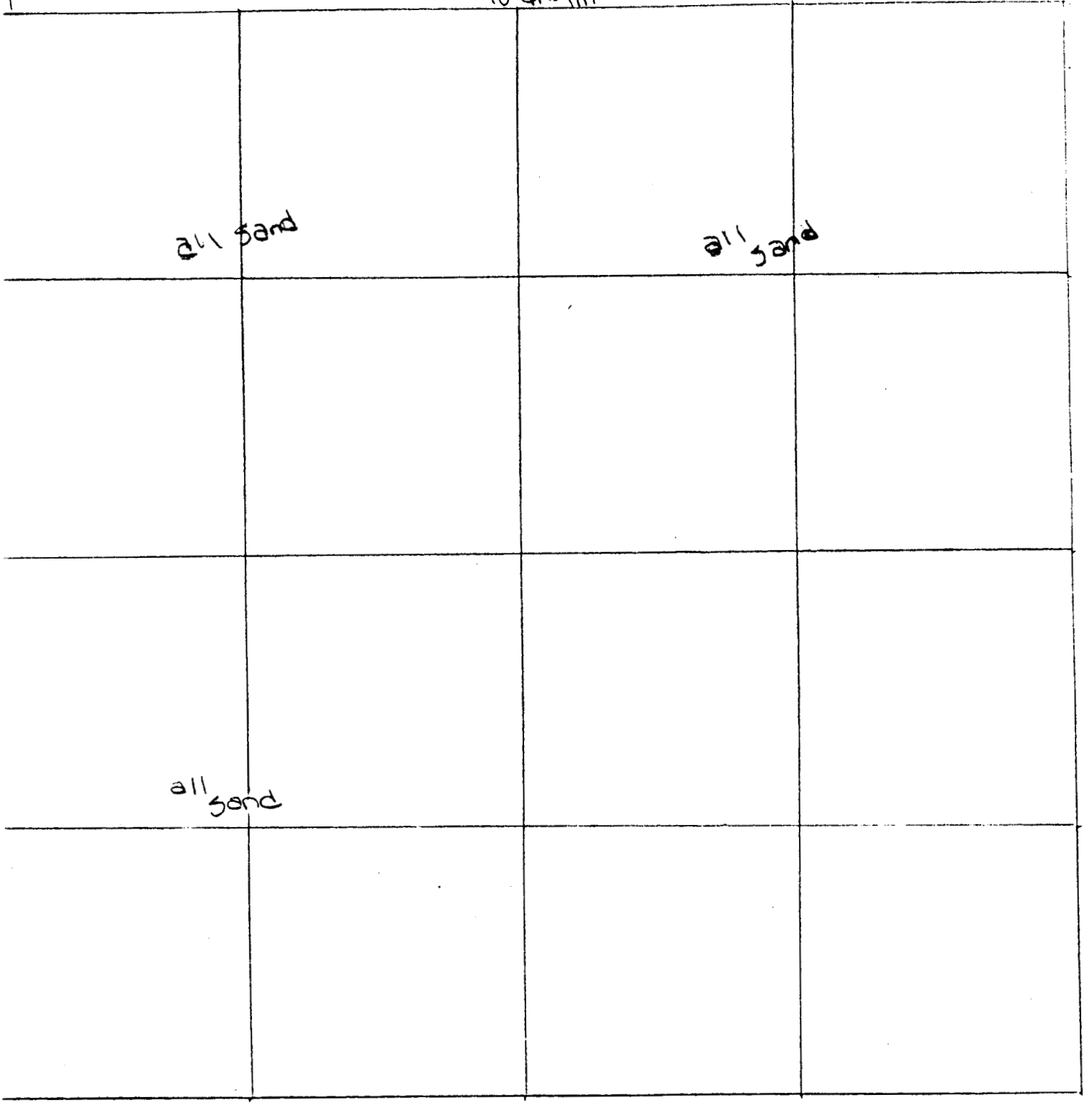


Mary Zaro
17 March, 1990
Sect # 3
Kamo Bay
Variations see page 1 of 3

Appendix I, cont.

Key:

1 10 cm = 1m #10



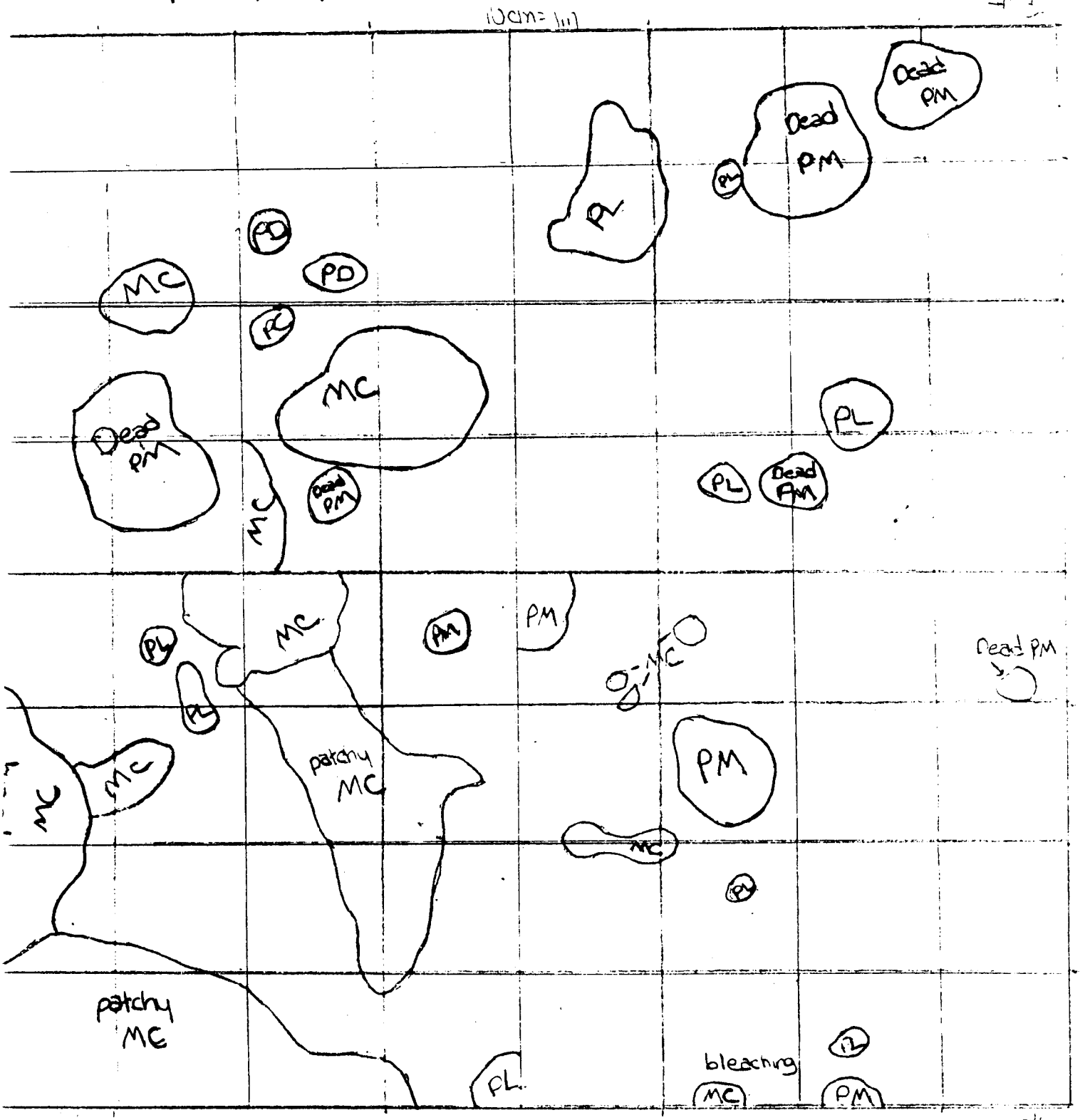
[redacted] Zero
19 March 1990
Site # 4
Area Bali

Conditions: sunny, warm, water temp cool
- cable, rough going w/ Zodiac
Observations:

Appendix I, cont.

Key:
MC: [illegible]
PC: [illegible]
PL: [illegible]
PM: [illegible]
PM: Porites lobata meandrina

Alot of dead P. meandrina Recorded point #2 below #1 on this data sheet.
point #4 - small colony of M. capitata - bleaching on the outside edges Point #2 - M. capitata was dominant species - patchy in areas shown



Mary Soro

17 March, 1990

Appendix I, cont.

Key
MC = Montipora capitata
PL = Porites lobata
PM = Pocillopora meandrina

Transect # 4

Kuna Bay

Observations: Mostly sand bottom with rocks. Some rocks covered with filamentous algae. See line data sheets

10 cm = 1m

#6

sand

sand

sand and rocks

Dead PM

PL

PL

PL

PL

PL

PM

PL

Echinometra mathei

rock

MC

sand and rocks

sand

PL

rubble

#5

Key

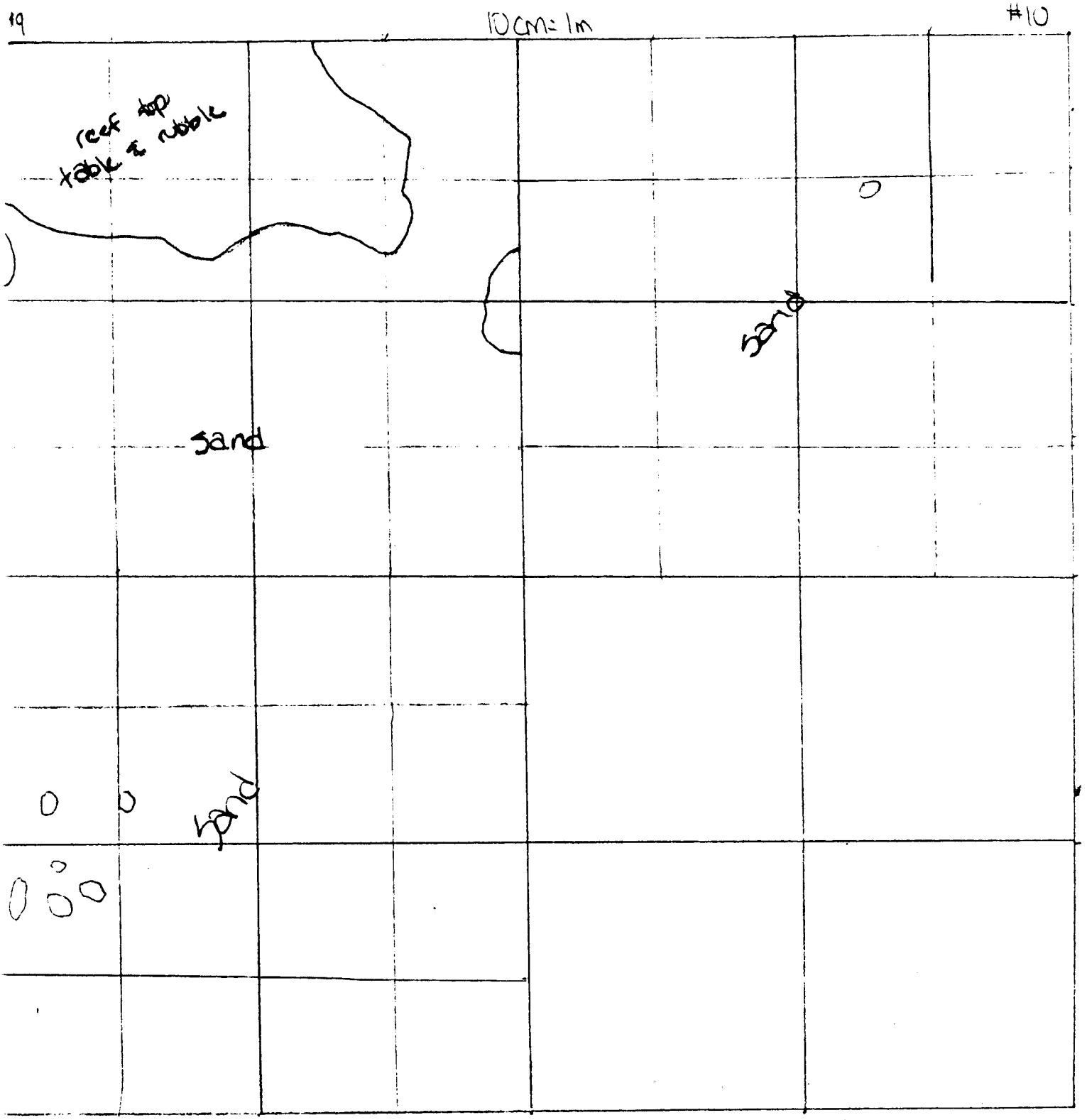
17 March, 1990

Appendix I, cont.

Point # 4

Guam Bay

Observations: Algae only living substrate on this sheet Reef top table, rocks, and sandy bottom. No live coral



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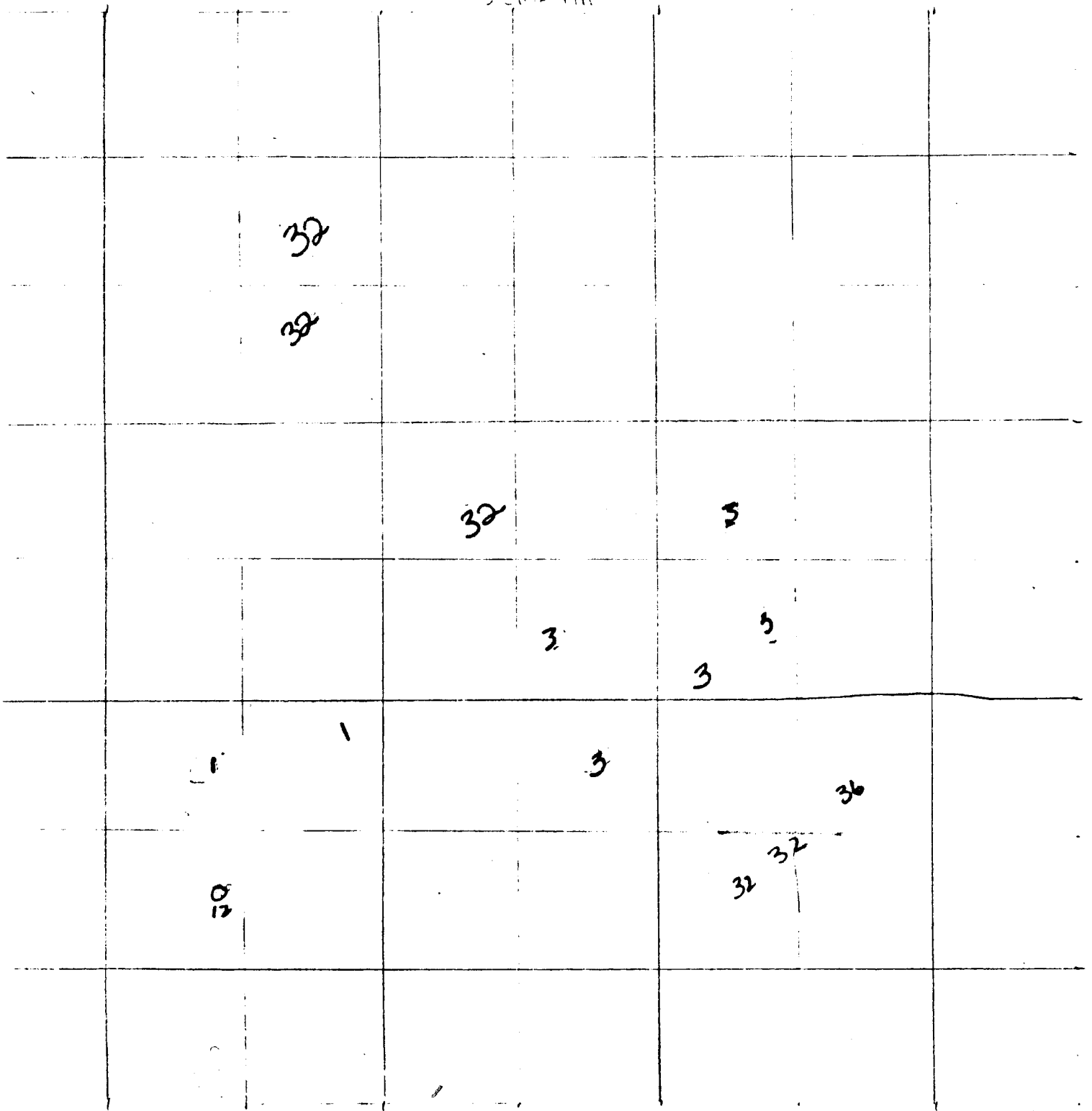
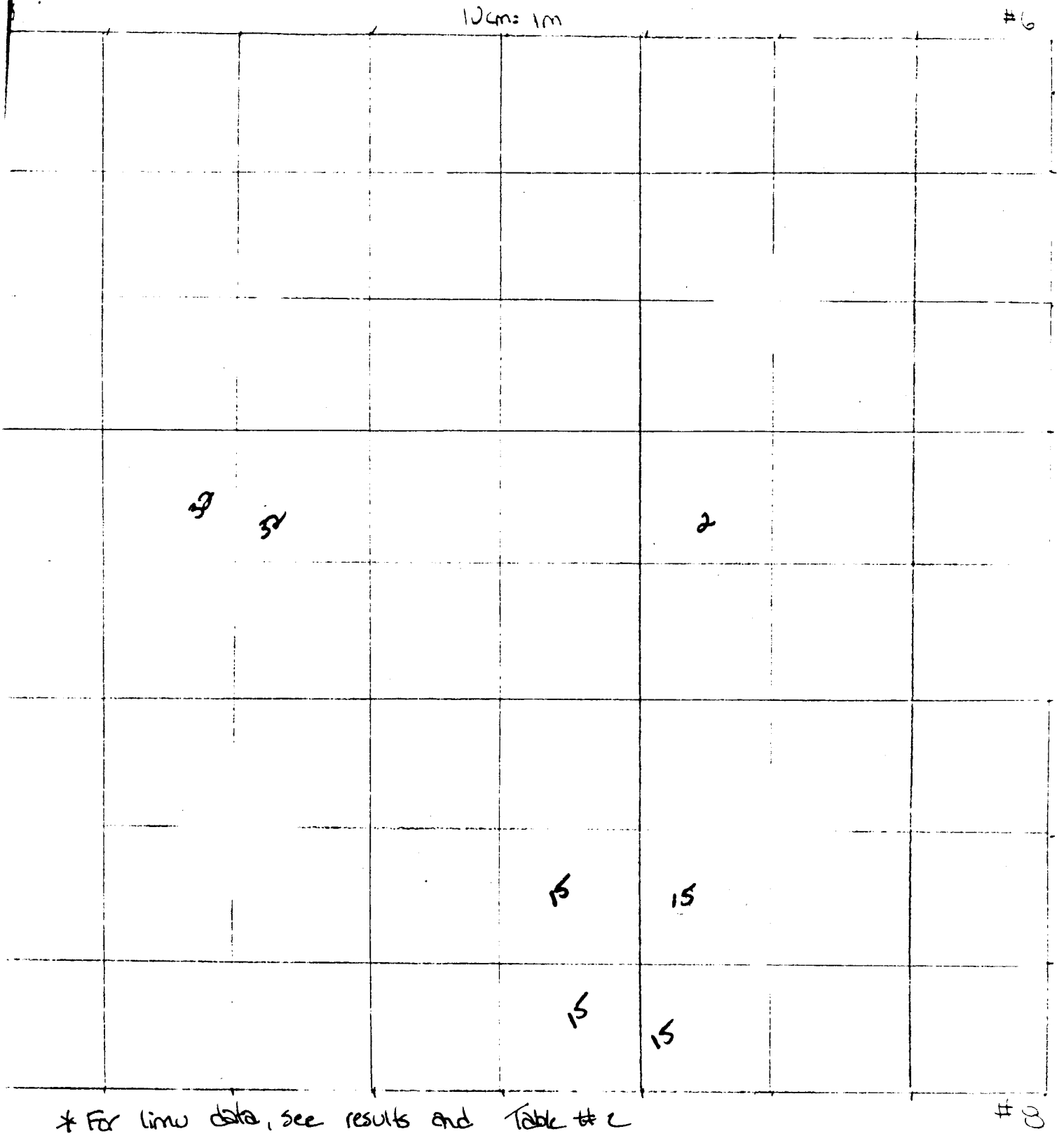


* for limu data, see results and Table # 2

Chem I
3/17/90
Lab # 4
Kama Bay
Initials:

Appendix I, cont.

Key



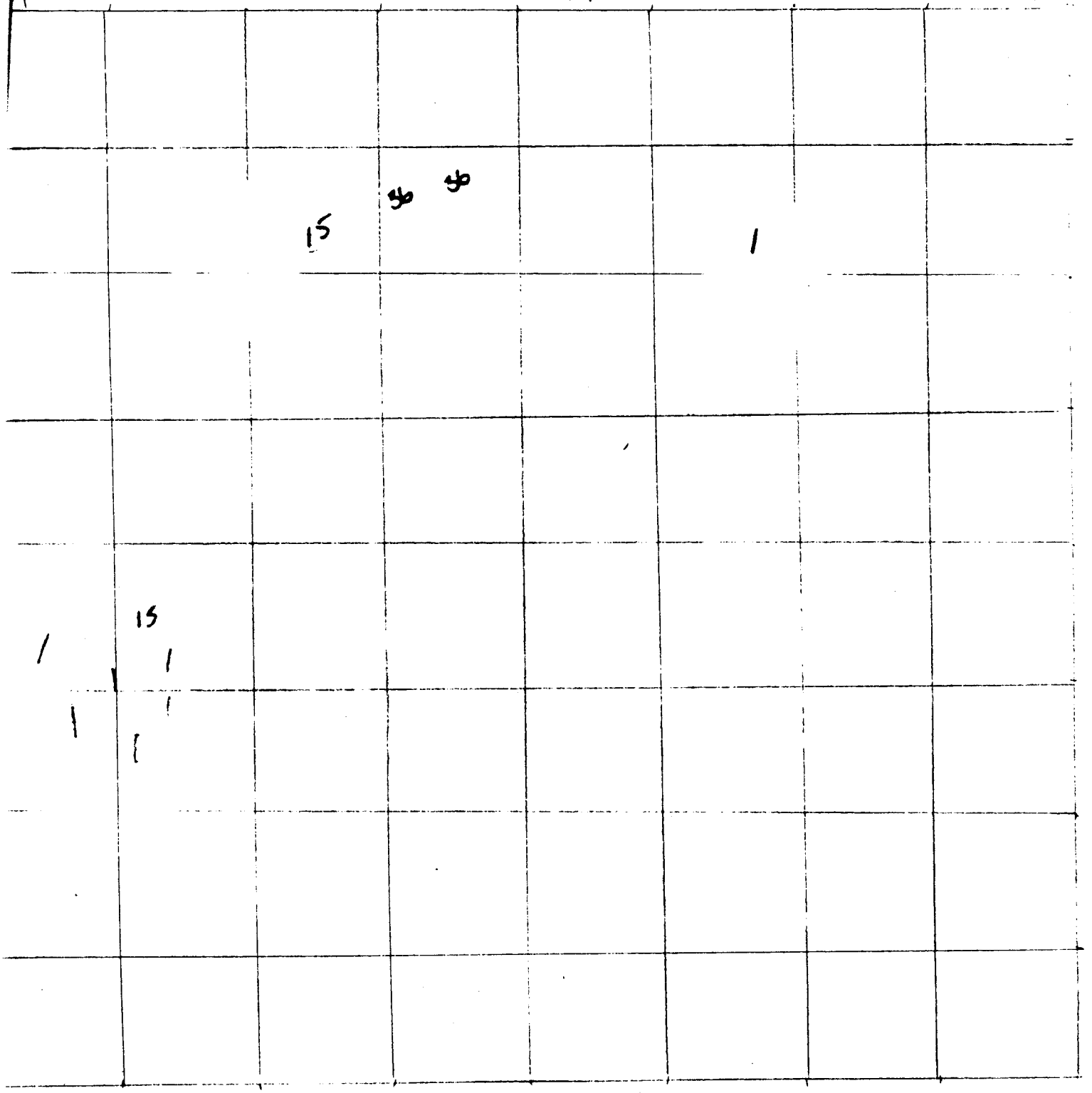
* For limu data, see results and Table # 2

Appendix I, cont.

Key

Chem
3/17/90
4
ano Body
notions

9 10 cm = 1m #10



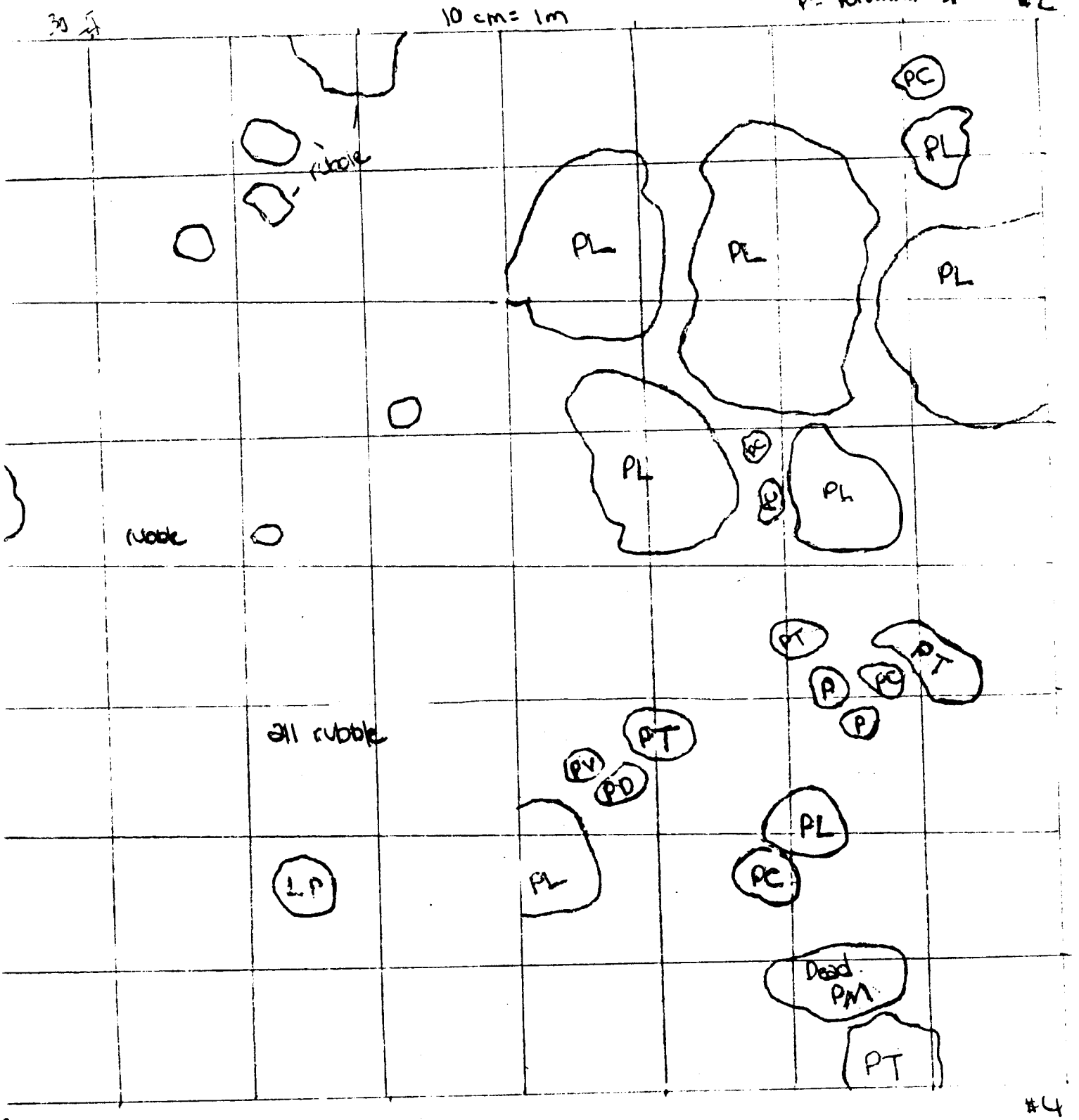
11 For line data, see results and Table #2

Mary Sano
5 July 1990
5 Hanauma Bay
ns: partly cloudy
Windy - small swells - tide going out

Appendix I, cont.

Key
PL = Porites lobata
PC = Porites compressa
LP = Leptastrea purpurea
PD = Pocillopora damicornis
PM = Montipora meandrina
PT = Pavona varians
PV = Pavona varians
P = Porolithon sp.

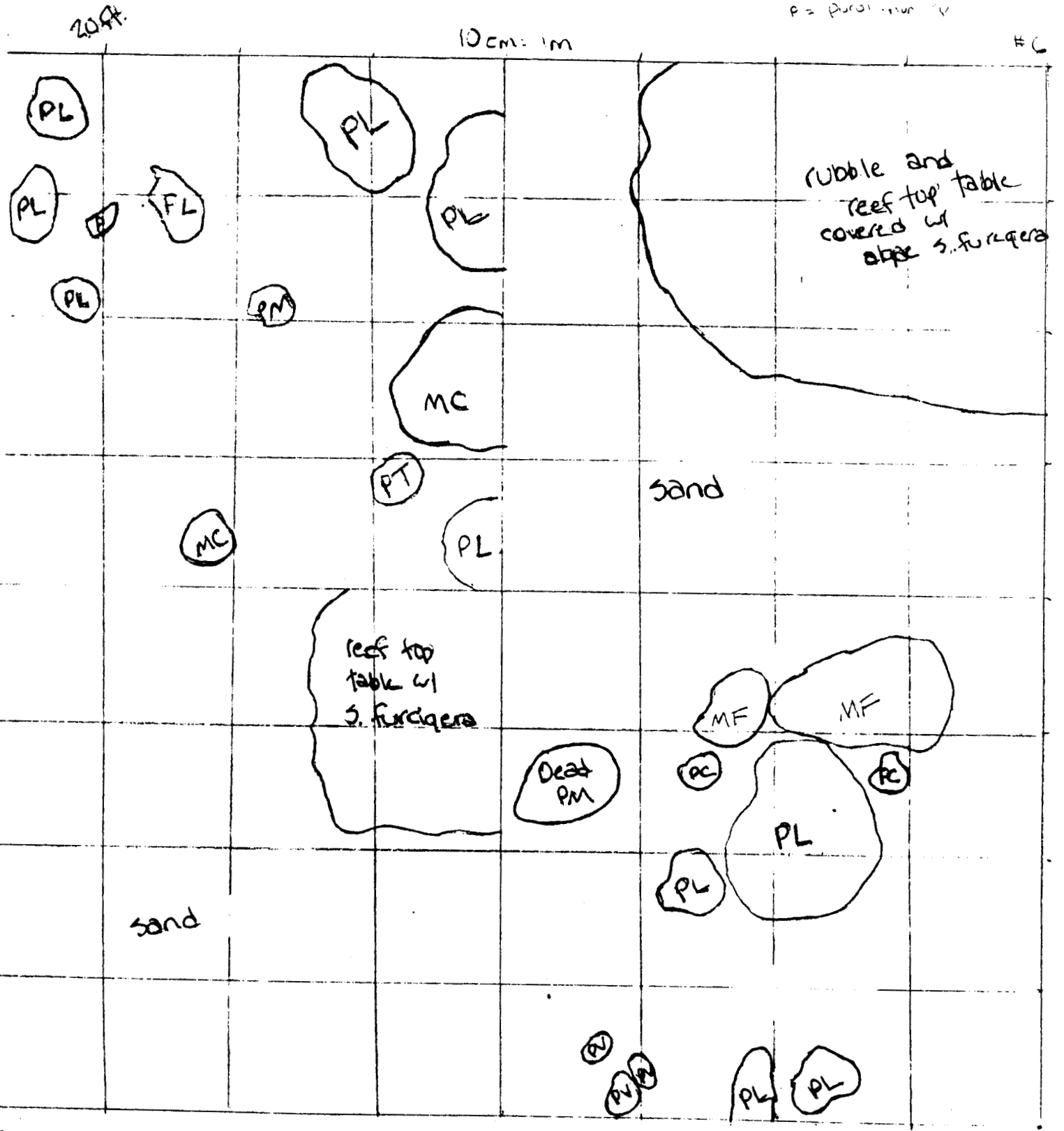
#1 - no live coral - some rubble and sandy action. #2 - Limited lobata with small colonies of P. compressa. #3 - All rubble bottom with ion of L. purpurea. #4 - small colonies of varied species



Saro
25 July, 1990
#5 Harama Bay

Appendix I, cont.

Key

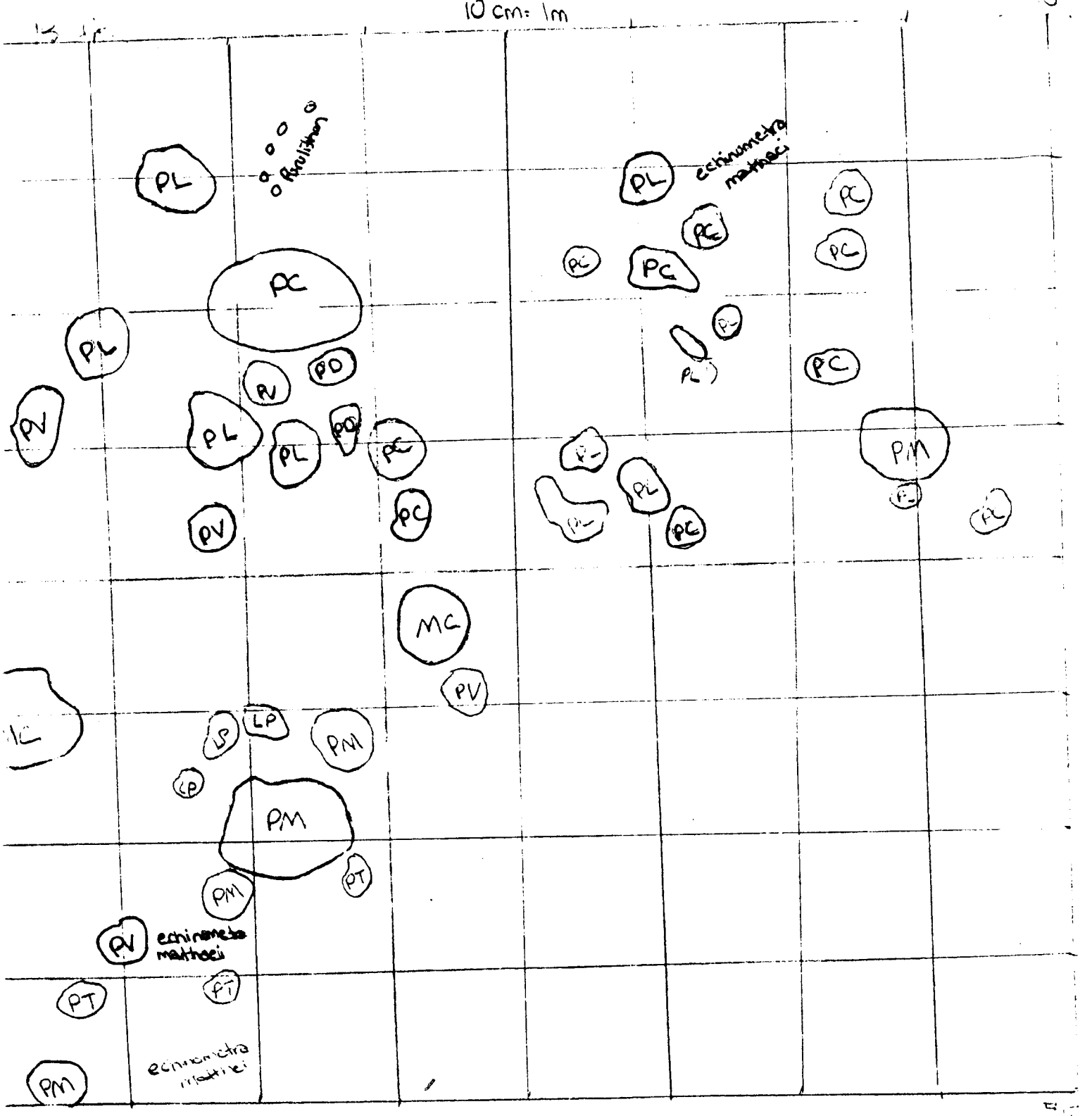


Mary Sano
35 July, 1990
Transect #5 Hanauma Bay

A-pendix I, cont.

Key
LP = Leptastrea purpurea
MC = Montipora capitata
PC = Porites compressa
PD = Porites duerdeni
PL = Porites lobata
PM = Pocillopora meandrina
PT = Palmyra tuberculosa
PV = Porites vernicosa

variant: #9-11 - all have diversity of small colonies of various genuses. Echinometra mathaei - only other invertebrate sighted on Transect #5.



DPR 102-88

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU
TELEPHONE 523-4525
523-4527

Date Issued: JULY 20, 1990

PERMISSION TO DRIVE 1 TRUCK & BOAT W/TRAILER ~~[illegible]~~ DOWN TO THE BEACH

XXXX General
_____ Athletic
_____ Camping
_____ Picnic

PERMIT

For the use of:

HANAUMA BAY BEACH PARK
(PARK OR FACILITY)

Athletic Field No. _____ Trailer, Camper _____

Picnic Site No. _____ Camping Site No. _____

ISSUED TO:

UNIVERSITY OF HAWAII - MARINE OPTION PROGRAM
STEVE RUSSELL
HON. HI

MAINTENANCE: _____

FOR: STEVE RUSSELL

Phone: Business 948 8433 Home _____

APPLICANT'S SIGNATURE

Deposit	$ NONE
Fee	$
Processing Charge	$
Facilities	$
Utilities	$
Rental Service	$
Commercial Fee	$
Others	$
Cash $	Check $
TOTAL $	NONE

NO DRIVING OR PARKING ON GRASS, ANIMALS, GUNS, OPEN FIRES, CUTTING OF TREES, DISTURBING NOISE. SEE PERMIT FOR FURTHER RULES AND REGULATIONS. PERMITTEE SHALL HAVE PERMIT READILY AVAILABLE AT ALL TIMES.

PERMIT IS FOR THE FOLLOWING DAYS:

Date JULY 25, 1990 to _____

Time 7:30 AM to 12 NOON

Permit is for _____ persons or for the purpose of:

SCIENTIFIC SURVEY

DEPARTMENT OF PARKS AND RECREATION
City and County of Honolulu

By: U. JUDD

Permit No. 72606

TO APPLICANT

ISSUED SUBJECT TO TERMS ON REVERSE SIDE

DEPARTMENT OF LAND AND NATURAL RESOURCES

Division of State Parks, Outdoor Recreation and Historic Sites

PERMIT

PERMIT NUMBER: 096300

REVISION NUMBER: 1

PERMIT TYPE: SPECIAL USE PERMIT -- SPECIAL USE

ISSUED TO:

MARINE OPTION PROGRAM
UNIVERSITY OF HAWAII
1000 POPE ROAD, ROM 229
HONO HI 96822

PERSON TO CONTACT:

Name: MR. STEVE RUSSELL
Phone: Home: ( )
Bus.: (808) 9488433
Emergency Contact:
Name: MR. STEVE RUSSELL
Phone: (808) 9488433

ASSIGNED AREA: Island: OAHU
Park: HANAUMA BAY STATE UNDERWATER PARK
Site:

DATE AND TIME PERIOD:
Date: From 07/25/90 To 07/25/90
Time: From 7:30 A.M. To 12:00 NOON
Total nights on permit:

NUMBER OF PERSONS: Total: 6
Adults:
Under 12:

NUMBER OF PARKING PERMITS: 1

Special Conditions:
Except as otherwise specified on permit: no commercial activities including advertising & sales allowed on premises; no money collection allowed on premises; no drinking, possession or use of alcoholic beverages.
PERMITS FOR HANAUMA BAY BEACH PARK MUST BE OBTAINED FROM THE CITY & COUNTY OF HONOLULU, DEPT. OF PARKS & RECREATION PHONE 523-4525.
permit to launch and anchor a small inflatable boat
anchor to be set by hand

I have read and agree to abide with the above Special Conditions and the General Rules on the reverse side.

x Steve H. Russell
Permittee Signature

State Parks Administrator

Issued By: BCG
Issue Date: 07/24/90

REV. 11/87

PERMITTEE

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

December 22, 1989

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

PERMIT TO ENGAGE IN CERTAIN PROHIBITED ACTIVITIES IN THE HANAUMA BAY MARINE LIFE CONSERVATION DISTRICT

The Board of Land and Natural Resources hereby grants permission under the authority of Chapter 13-28, Administrative Rules of the Department of Land and Natural Resources, and all other applicable laws, to:

Mr. Steve Russell
Marine Option Program
University of Hawaii at Manoa
1000 Pope Road, Room 229
Honolulu, Hawaii 96822

This permit allows the following activity within the Hanauma Bay Marine Life Conservation District under the terms and conditions listed below:

1. This permit allows the collection of no more than 10 samples of limu for the purpose of identification during a survey requested by the City & County of Honolulu, Dept. of Parks & Recreation. The survey is a repeat of 1985 transects and the study will provide comparative data on any recent deterioration of the marine environment.

2. This permit allows the use and removal of non-destructive gear such as fish transect lines for conducting fish censuses.

3. Discretion shall be used to avoid conflict with divers, swimmers and others while collecting at this location.

4. This permit is not transferable or assignable and must be possessed at the activity site and made available for inspection on demand.

5. This permit does not by implication authorize the primary permittee or any designated assistant to engage in any other activity if in violation of any other State, Federal or County law, regulation or ordinance.

PERMIT TO ENGAGE IN CERTAIN PROHIBITED ACTIVITIES IN
THE HANAUMA BAY MARINE LIFE CONSERVATION DISTRICT

6. The permittee shall be responsible and accountable for all actions under this permit.

7. The permittees shall comply with all applicable provisions of the Department of Land and Natural Resources Administrative Rules, Chapter 13-28 (enclosed) not exempted by this permit.

8. This permit shall be in effect for the period December 27, 1989 to February 28, 1990, for the specified activity.

9. Within one month of its expiration, the permittee must return this permit to the Division of Aquatic Resources with complete information of all activities done under this permit.

10. This permit does not in any way make the Board of Land and Natural Resources of the State of Hawaii or its employees liable for any claims of personal injury or property damage to the permittees which may occur while engaged in activities authorized under this permit; further, the permittees agree to hold the State harmless against and claims of personal injury, death, or property damage resulting from their activities.

11. The primary permittee or a designated assistant responsible for the field collecting activity shall notify the Division of Conservation and Resources Enforcement at least 48 hours in advance of any field collecting activity and provide such information as: location; date; time; and number of persons to be involved. Telephone - Honolulu 548-5918; 548-3966; or 548-5919.

Keith W. Ahue

WILLIAM W. PATY, Chairperson
Board of Land and Natural Resources

cc: [x] DOCARE
[x] Fisheries

PERMIT TO ENGAGE IN CERTAIN PROHIBITED ACTIVITIES IN THE HANAUMA BAY MARINE LIFE CONSERVATION DISTRICT

SIGNATURE AND ACKNOWLEDGEMENT

By my signature below, I attest that I understand the terms and conditions (Nos. 1 to 11) on the "Permit to Engage in Certain Prohibited Activities"; further, I agree to abide by all of the terms and conditions when conducting baseline studies under authority of this permit.

PRINCIPAL PERMITTEE: Steve Russell
STEVE RUSSELL

ASSISTANTS:

Signature: George Stender
Print Name: George Stender

Signature: May S. Saho
Print Name: May Saho

Signature: Bettsy Reynolds
Print Name: Bettsy Reynolds

Signature:
Print Name:

Signature: Kyle Miller
Print Name: Kyle Miller

Signature: Cheryl Rosenfeld
Print Name: Cheryl Rosenfeld

Signature:
Print Name:

Signature:
Print Name:

Letters

To heal Hanauma Bay . . .

Let's clean it up

Lately whenever I snorkel Hanauma Bay, I come back with my diver's "goodie bag" stuffed with specimens — of marine debris. Last weekend, my catch included a chili bucket, bottles for bleach, shampoo and sunscreen, fish net, monofilament line and an enormous wad of plastic bread wrappers and frozen pea bags.

As I struggled with my unwieldly load against a fast current, I began to wonder if I was about to be the first human victim of marine debris, along with countless birds, fish, turtles, seals, whales and dolphins. I began to fantasize public reaction to my sad demise:

Perhaps everyone would be inspired to use the park's many trash containers for their bread wrappers and pea bags. Park graphics would be changed to warn against the dangers of marine debris. Dive clubs would organize weekly collections of floating debris. Litter laws would be strictly enforced.

Ingenious solutions would be tried, such as accepting a sack of plastic junk as payment for a trolley ride up the hill. The bay would quickly become the pristine place people are always telling newcomers about.

But a wave and a lucky kick brought me and my debris into quieter waters and back to reality.

MARY PICKETT

Let's take bay seriously

Much of the overuse and abuse of Hanauma Bay could end now if the state and county would stop treating it as an ordinary beach park. Its use should be limited to those activities for which it is world famous and uniquely suited — snorkeling and scuba diving in a marine park.

To cut down on crowding and littering, nonrelated uses such as picnicking should be confined to the upper area where the food concession should be relocated. To cut down on fresh water runoff into the bay, showers and dressing rooms should also be relocated above, with only toilets at beach level.

Following the example of national parks, the feeding of wildlife (fish) should be prohibited and an educational program conducted in the pavilion. This would significantly cut down on water pollution.

A cleaner beach could be assured by prohibiting smoking and starting a trapping program to cut down on the pigeon population whose abundant feces also pose a health threat.

Rule out the equipment concession, which attracts more visitors to an overused spot. I foresee howls of protest, but what shortsighted fools we would be not to take strong measures to protect a natural wonder.

MARGARET E. KIDWELL

Let's close Hanauma

Having just read Barbara Hastings' two articles on "The Spoiling of Hanauma Bay" and sharing her concern for this treasure, I feel compelled to offer a simple solution to the problem. City and County of Honolulu and the State of Hawaii should cooperate, for a change, and close the park for one year. Give it a chance to rejuvenate, rest, recover, and then reopen it by permit only. No commercial use would be allowed, parking would be restricted to a limited number of automobiles.

Hanauma Bay is more important to the people of the state than the dollars paid to the state by tour companies. We should get our priorities in order by saving Hanauma Bay for the generations to come, not for a playground for tourists.

JACK LENNON

9/4/89 ADV.

Saving Hanauma may take a miracle of cooperation

Second of two articles

By Barbara Hastings
Advertiser Science Writer

Hanauma Bay is overstressed. On that, virtually everybody connected with the once-tranquil swimming and snorkeling beach agrees.

De-stressing it, however, may take the wisdom of Solomon and the patience of Job.

Each day thousands of people go to Hanauma — at least eight times the park's recommended load.

A 1977 study done for the city says the park's carrying capacity — for the lower bay area and upper picnic area combined, is 1,363 people. City figures indicate that the daily load now is 10,000 people; 8,000 of them making it down to the beach area, which can sustain about 1,000.

That 12-year-old study included a survey indicating 96 percent of Hanauma Bay's visitors came by car, and its recommendations were based on that. Today, more than 50 percent and possibly 80 percent of them come by tour bus and van.

The park is so choked that the Governor's Ocean Resources Tourism Development Task Force says that totally congested or trashed-out areas such as

Hanauma could give Hawaii a bad reputation in the tourist market.

The task force recommends, among other things, that popular sites be managed to avoid overuse. But managing Hanauma Bay would involve the city government, which oversees the beach park; the state government, which oversees the undersea park (Hanauma is a marine sanctuary); and the tourism industry, which deposits most of the thousands of bay visitors every day.

"If there's not proper management, you're not going to have it too long," said Ralph Goto, the city's lifeguard division chief. And Goto added the refrain of many others. "The visitor industry really needs to get involved. It's the goose that laid the golden egg."

The tour buses drop the visitors off "and turn 'em loose," Goto says.

The city is working on a management plan. A team has just been set up within the Parks and Recreation Department to identify the problems of Hanauma and set about correcting them.

Those problems range from the overload of people to a needed upgrade in sewage handling to a lack of information — information from cultural advice (don't leave filter cigarette butts in the sand), to water safety to information on the rich underwater museum.

"We're going through a master planning process," says Walter Ozawa, city parks director.

Ozawa can tick off a list of possible solutions — then immediately list their drawbacks:

- Set up a gate to control entry into the park. Drawback — negative impact on Kalanianaole Highway.
- Restrict commercial vehicles, such as tour vans and buses. Drawback — this would

See Hanauma, Page A-8

Appendix III, cont.

Hanauma he

Officials worry

FROM PAGE ONE

mean more cars.

● Limit access in the way national parks do. Once a fixed number of people has been admitted, the gate is closed until the count is down. Drawback — local people want to be assured access to the bay.

If you charge admission, Ozawa says, or parking fees, "you're going to raise the sensitivities of the community."

Hanauma has always been a recreational beach, Ozawa says. Yet since it became a marine conservation district its appeal, particularly to tourists, has broadened. It's a swim-along aquarium that eight of every 10 tourists visit.

"How do you convince people that it's more than just a beach resource?" Ozawa asks.

"We thought about brochures" to outline the unique and fragile nature of the area, he said, "but those are the things that usually end up in the water."

Two University of Hawaii Sea Grant Program people, Robert Bourke and Mike Markrich, have proposed a non-profit interpretive nature tour/walk. Everybody likes the idea, Ozawa says. Verbal support has poured in. But nobody so far has offered to fund it. "We're looking for grant money," says Bourke.

While an appreciation of the environment would be a main focus of the tour, Bourke said, so would safety. Many of the people who are swimming and snorkeling in the bay, or walking along the wave-washed ledges, are not ocean-experienced swimmers.

How did Hanauma Bay get out of control? Quite a few people believe, as Bourke does, that it happened because of attempts to protect it.

Back in 1967, the area was made a fish sanctuary, a good idea, Bourke says, "But you have to manage the people as well as the resource."

"It didn't attract the hordes of tourists" before it was protected. "The environment acts as an attractor," and the degradation of the environment follows, he said.

The state created the marine preserve and indeed holds jurisdiction over it, from the water's edge. Yet it's the city that must maintain the beach park.

Ray Tabata, a coastal resources specialist with Sea Grant, says this dual jurisdiction is the basic management problem for the bay. "What goes on on the land is going to affect what's

An empty bag of mixed vegetables is testament to a diet experts worry will harm the bay's underwater ecosystem.

going on in the water," he says.

"The reef is flat and very heavily impacted" by the many people walking on it, Tabata said. "Besides, there are so many people, that after a certain time in the morning you cannot see" because the water is clouded.

Tabata says some kind of interpretive information, such as planned by Bourke and Markrich, is a good step. Other possibilities are for tour operators to provide information to the groups before they arrive.

Visitors need to know, Tabata says, "what's special about the area and how to conduct themselves in a safe and appropriate manner." They need to be educated, he says, about poor etiquette, such as leaving things in the sand.

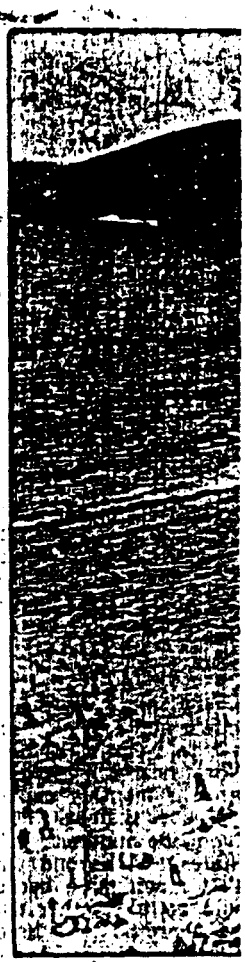
But Tabata believes, as do many others, that the resident has forsaken Hanauma Bay, given it up to the tourists. And the local resident resents it, Tabata believes. Perhaps only 5 percent of the people who use the bay are from Hawaii.

Goto, the chief lifeguard, says he thinks Tabata's estimate is in line.

He has five lifeguards assigned every day to Hanauma. None speaks Japanese well, but one or two know a few words, he says. The guards rely on guides from the large tour groups to help them translate, he said.

He's concerned about that. While Hanauma Bay looks safe and tranquil, it's more dangerous then it appears.

"We can communicate with the English-speaking visitor," he says, "we can give them advice" about the conditions.



Hanauma Bay is a cit

Trams run people fro

Judge lifts Hanauma rules ban

Limits on tourists will start Monday

By Ken Kobayashi
Advertiser Courts Writer

New city rules severely limiting tour company use of Hanauma Bay will go into effect Monday.

A state judge reversed himself yesterday and lifted his earlier order temporarily banning the city from enforcing the new regulations.

They are designed to cut down on crowding and overuse of the popular beach and snorkling spot.

A city attorney said the rules will go into force Monday. But a spokesman for the tour firms that had sought the restraining order said they will start abiding by the regulations immediately.

Acting Circuit Judge James Dannenberg ruled last week that the city's public notice about the hearings on the new rules was defective. But yesterday he reconsidered as a result of a previously unnoticed state law passed last year that liberalizes public notice requirements.

City Deputy Corporation Counsel Cora Avinante-Tanaka said the judge felt that the city's notice did meet the requirements outlined in the new law. The new law had not been cited by attorneys on either side during last week's hearing.

The new rules limit commercial tour groups to 15-minute visits in the parking area above the bay, thereby effectively banning tour companies from dropping off the visitors and allowing them to visit the beach.

Peter Esser, attorney for the Japan Hawaii Travel Association, which is challenging the new rules, said his group will continue to press for an injunction that would stop enforcement of the new rules.

A hearing on that request will be scheduled next week on a date yet to be set, he said.

Randell Yamane, spokesman for the association, said the tour companies will will abide by the new rules pending the court hearing.

He said the group favors conservation and also wants to protect the bay, but said the city has rejected their alternatives:

- To restrict visits during certain hours of the day;
- To prohibit visits during weekends: and
- To pay a "user" fee.

"We feel that (despite) everything we did, they still put down these strict rules and regulations," he said.

The association includes 49 tour companies. Many others are affiliated.

Yamane said on average, about 800 of the companies' clients visit the beach each day.

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